Remarks

Reconsideration of this Application is respectfully requested. Applicants have amended claim 34 to place it and dependent claims 35-49 in condition for allowance, or in better form for appeal.

Upon entry of the foregoing amendment, claims 34-49 are pending in the application, with claim 34 being the independent claim. Claim 34 has been amended. This change is believed to introduce no new matter, and entry is respectfully requested.

Based on the above amendment and the following remarks, Applicants respectfully request that the Examiner enter this amendment and withdraw all outstanding rejections.

Rejections Under 35 U.S.C. § 112, first paragraph

The Examiner rejected claims 39, 41 and 46-49 under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. In particular, the Examiner stated,

> Those claims recite monitoring and adjusting temperature and/or pressure, sensing and controlling a gas stream based on moisture, and pressurizing and/or heating a gas at first and second pressures and/or temperatures when the gas reaches a first or second levels and/or temperatures. However examiner does not find a sufficient description in the specification such that one skilled in the art is enabled to reproduce these recitations.

Final Office Action, p. 2.

Applicants traverse this rejection.

The specification describes in detail an open-loop system in which the user can manually adjust controls to cause the electrical control system to adjust the pressure and

temperature of the gas and/or the temperature of the solutions to be dried. The specification also describes in detail a closed-loop system in which the electrical control system controls these same parameters based on comparisons of measured values to predetermined values. (Page 4, para. 0016 and page 9, paras. 0057-0058). A combination closed-loop and open-loop system is also described. (FIG. 16, page 18, para. 0097 - page 19, para. 0101). In particular, electrical control system 130 controls one or more of fan 116 and heaters 120, 216 and 218. Electrical control system 130 can include, for example, one or more dual-zone heater controllers 224 to control heaters 120, 216 and 218 and an AC motor controller 228 to control fan blower motor 116. (Page 12, para. 0072).

Claim 39 relates to monitoring a pressure of the gas and adjusting the pressure of the gas to correspond to a desired pressure. These claimed features are clearly enabled by the detailed description in the specification of the open-loop control system 1710 of FIGs. 17A and 17B. In particular, the specification provides that a pressure sensor 1720 is disposed downstream of fan 116 to measure the pressure of gas 118. (Page 21, para. 0110). As shown in FIG. 4, control 412 permits a user to control the rate of drying of solutions 1114 and to reduce or prevent bumping and boiling of the solutions 1114 by adjusting gas pressure. (Page 22, para. 0115). The specification further describes, with reference to FIG. 18, that electrical control system 130 can include a pressure switch (sensor) downstream of fan 116 that can sense if the pressure is too low or too high, so that electrical control system 130 can adjust the speed of fan 116. (Page 23, para. 0119).

Claim 41 relates to monitoring a temperature of the solution and adjusting the temperature of the solution to correspond to a desired temperature. These claimed features are clearly enabled by the detailed description in the specification of the open-loop control system 1710 of FIGs. 17A and 17B. In particular, the specification provides that one or

more temperature sensors 1744 are used to measure the temperature of the gas and/or the temperature of the solution. An exemplary temperature probe is provided in the specification. (Page 21, para. 0110). The specification further describes that an LCD can provide the user with a visual indication of the temperature of the solution. An exemplary panel meter is also provided in the specification. (Page 21, para. 0111). As shown in FIG. 4, control 414 permits a user to control the rate of drying of solutions 1114 and to reduce or prevent bumping and boiling of the solutions 1114 by adjusting the temperature of the solution. (Page 22, para. 0115). Further, in the closed-loop example of FIG. 16, programmable interface dual-zone (PID) controller 1616 controls the temperature of solutions 1114 by comparing a signal indicative of a measured temperature with a signal indicative of a desired temperature of solutions 1114. PID controller 1616 adjusts the temperature of heating elements 216 and 218 according to the results of the comparison. (Page 19, para. 0099). An exemplary PID controller is provided in the specification. (Page 19, para. 0100).

Claim 46 relates to sensing a moisture content of the solution and terminating the drying when the moisture content of the solution reaches a predetermined level. These claimed features are clearly enabled by the detailed description in the specification of the combination open-loop and closed-loop system as shown in FIG. 16. In particular, moisture sensors 234 are positioned within or downstream of drying chamber 124. The electrical control system 130 terminates the drying process when the moisture content is reduced to a predetermined level. (Page 20, para. 0105). The specification further describes, with reference to FIG. 18, that one or more moisture meters 234 are disposed within each of front chamber 212 and rear chamber 214, or a single moisture meter 234 is disposed downstream

of dryer manifold 124. When the moisture level drops below the predetermined level, processing proceeds to and stops at step 1814. (Page 24, para. 0128).

Claim 47 relates to pressurizing the gas to a first pressure when a level of the solution is at a first level and pressurizing the gas to a second pressure when the level of the solution in the vessel is at a second level. These claimed features are clearly enabled by the detailed description in the specification of the combination open-loop and closed-loop system as shown in FIG. 16. For example, one or more level detectors 236 can be used to measure the level of solution 1114 in one or more vessels 614. Based on a measured level, electrical control system 130 can control the pressure of the gas 122. For example, when a solution level is at a high level, electrical control system 130 can set the pressure of gas 122 to a low setting, to reduce or prevent loss of solution due to foaming or bumping. When a sufficient amount of the solution dries, as detected by the level detector, the electrical control system can reset the pressure of gas 122 to a high setting. (Page 20, paras. 0103-0104). Further, in an open-loop setting, control 412 permits a user to manually control the rate of drying of solutions 1114 and to reduce or prevent bumping and boiling of the solutions by adjusting gas pressure. For example, when there is a relatively large amount of a solution 1114 in a vessel 614, the user can set gas pressure to low levels. When a sufficient amount of solution 1114 has evaporated, the user can set gas pressure to high levels. (Page 22, para. 0115).

Claim 48 relates to heating the gas to a first temperature when a level of the solution is at a first level and heating the gas to a second temperature when the level of the solution in the vessel is at a second level. These claimed features are clearly enabled by the detailed description in the specification of the combination open-loop and closed-loop system as shown in FIG. 16. For example, one or more level detectors 236 can be used to measure the

level of solution 1114 in one or more vessels 614. Based on a measured level, electrical control system 130 can control the temperature of the gas 122. For example, when a solution level is at a high level, electrical control system 130 can set the temperature of gas 122 to a low setting, to reduce or prevent loss of solution due to foaming or bumping. When a sufficient amount of the solution dries, as detected by the level detector, the electrical control system can reset the temperature of gas 122 to a high setting. (Page 20, paras. 0103-0104). Further, in an open-loop setting, control 416 permits a user to manually control the rate of drying of solutions 1114 and to reduce or prevent bumping and boiling of the solutions by adjusting gas temperature. For example, when there is a relatively large amount of a solution 1114 in a vessel 614, the user can set gas temperature to low levels. When a sufficient amount of solution 1114 has evaporated, the user can set gas temperature to high levels. (Page 22, para. 0115).

Claim 49 relates to heating the solution to a first temperature when a level of the solution is at a first level and heating the solution to a second temperature when the level of solution in the vessel is at a second level. These claimed features are clearly enabled by the detailed description in the specification of the combination open-loop and closed-loop system as shown in FIG. 16. For example, one or more level detectors 236 can be used to measure the level of solution 1114 in one or more vessels 614. Based on a measured level, electrical control system 130 can control the temperature of solutions 1114. For example, when a solution level is at a high level, electrical control system 130 can set the temperature of solutions 1114 to a low setting, to reduce or prevent loss of solution due to foaming or bumping. When a sufficient amount of the solution dries, as detected by the level detector, the electrical control system can reset the temperature of solutions 1114 to a high setting. (Page 20, paras. 0103-0104). Further, in an open-loop setting, control 414 permits a user

to manually control the rate of drying of solutions 1114 and to reduce or prevent bumping and boiling of the solutions by adjusting solution temperature. For example, when there is a relatively large amount of a solution 1114 in a vessel 614, the user can set the solution temperature to low levels. When a sufficient amount of solution 1114 has evaporated, the user can set the solution temperature to high levels. (Page 22, para. 0115).

Clearly, there is adequate description in the specification to enable one skilled in the art to make and use the invention as recited in claims 39, 41 and 46-49. Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw this rejection.

Rejections Under 35 U.S.C. § 112, second paragraph

The Examiner rejected claims 39, 41 and 46-49 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, the Examiner stated,

> Those claims recite monitoring and adjusting temperature and/or pressure, sensing and controlling a gas stream based on moisture, and pressurizing and/or heating a gas at first and second pressures and/or temperatures when the gas reaches a first or second levels and/or temperatures. However examiner does not find a sufficient antecedent basis in the specification such that one skilled in the art can perform these recitations.

Final Office Action, p. 3.

Further, the Examiner noted that claim 41 incorrectly depends from itself. Applicants have amended claim 41 to correct the incorrect dependency, such that claim 41 now depends from claim 34.

Applicants traverse the remainder of this rejection. For all of the reasons set forth above with respect to the Examiner's rejection of claims 39, 41 and 46-49 under 35 U.S.C.

§ 112, first paragraph, there is also sufficient antecedent basis in the specification for the features recited in these claims. Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw this rejection.

Rejections Under 35 U.S.C. § 102(b)

The Examiner rejected claims 34-41, 44 and 45 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,513,445 to Farrag ("Farrag"), or U.S. Patent No. 5,553,395 to Wen *et al.* ("Wen") or U.S. Patent No. 5,558,842 to Vassiliou *et al.* ("Vassiliou").

Applicants traverse this rejection. The present invention relates to a method for drying solutions containing macromolecules. Claim 34, the sole independent claim, recites the step of "receiving a vessel containing the solution," wherein the "solution" is recited in the preamble as "containing macromolecules." The specification describes macromolecules as including,

> DNA, proteins, lipids, carbohydrates, RNA, oligonucleotides, polypeptides, cells, antibiotics, chemical compounds, enzymes (DNA or RNA polymerase such as thermostable DNA polymerase include *Taq*, *Tma*, or *Tne* DNA polymerases, restriction endonucleases, ligases, reverse transcriptases, etc.), antibodies or combinations thereof.

(Pages 7-8, para. 0051).

Farrag relates to a method for operating a drier for at least one of powdered, granulated and pourable materials to be used in blow molding, stretch-blow forming or other plastic molding processes. The materials used for plastic molding processes do not fall within the scope of the definition of "macromolecules" as used in the specification and claims of the present invention. As such, Farrag does not disclose the step of receiving a vessel containing the solution, as recited in claim 34.

Wen relates to a cone-shaped bubbler for use with solid metal organic source material used in metal organic chemical vapor deposition systems. The materials used for metal organic chemical vapor deposition do not fall within the scope of the definition of "macromolecules" as used in the specification and claims of the present invention. As such, Wen does not disclose the step of receiving a vessel containing the solution, as recited in claim 34.

Vassiliou relates to a device for making reaction products by atomizing a first liquid containing a reactant into a gas containing a second reactant. Vassiliou does not disclose a method for drying solutions containing macromolecules. The purpose of the device of Vassiliou is to atomize a first liquid and spray it onto a gas containing a second reactant. Vassiliou does not disclose directing a gas into a vessel that holds a solution containing macromolecules.

Accordingly, neither Farrag, Wen nor Vassiliou disclose the invention as set forth in claim 34. Claims 35-41, 44 and 45 depend from and add additional features to claim 34. As such, these claims are patentable for at least the same reasons as set forth above with respect to claim 34. Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw this rejection.

Rejections Under 35 U.S.C. § 103

The Examiner rejected claims 42, 43, 46 and 47 under 35 U.S.C. § 103 as being obvious in view of Farrag, or Wen or Vassiliou. In particular, the Examiner asserted,

> Farrag or Wen et al. or Vassiliou et al. discloses the claimed invention except for the tilting, the sensing, or the plurality of vessels. It would have been an obvious matter of design choice to modify the teachings of Farrag, Wen et al., or Vassiliou et al. to provide the tilting, the sensing, or the plurality of vessels, since applicant has not disclosed that the tilting, the sensing, or the plurality of vessels solves any stated problem in a new or unexpected way or is for any particular purpose which is unobvious to one of ordinary skill and it appears that the claimed feature does not distinguish the invention over similar features in the prior art since, the method of Farrag, Wen et al. or Vassiliou et al. will perform the invention as claimed by the applicant with any orienting, or sensing, or number of vessels.

Final Office Action, p. 5

Claims 42, 43, 46 and 47 depend from and add additional features to claim 34. As such, these claims are patentable for at least the same reasons as set forth above with respect to claim 34. Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw this rejection.

Conclusion

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.

Linda E. Alcorn

Linda E. Alcorn
Attorney for Applicants
Registration No. 39,588

Date: 9/9/02

1100 New York Avenue, N.W.
Washington, D.C. 20005-3934
(202) 371-2600

Version with markings to show changes made

Claims 34, 41 and 46 are amended as follows:

34. (Once Amended) A method for drying a solution containing macromolecules, comprising the steps of:

(1) receiving a vessel containing [a] the solution; and

(2) directing a gas into the vessel.

41. (Once Amended) The method according to claim [41] 34, further comprising the step of:

(3) heating the solution in the vessel.

46. (Once Amended) The method according to claim 34, further comprising the steps of:

(3) sensing a moisture content of the solution; and

(4) terminating [steps (1) and] step (2) when the moisture content of the solution reaches a predetermined level.